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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/552,920

10/11/2005

Shoichiro Watanabe

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MCDERMOTT WILL & EMERY LLP

600 13TH STREET, NW

WASHINGTON, DC 20005-3096

EXAMINER

ARCIERO, ADAM A

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

10/06/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/552,920	Applicant(s) WATANABE ET AL.	
	Examiner ADAM A. ARCIERO	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/11/2005, 12/27/2006, 1/10/2007, 6/25/2007, 8/29/2008</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Summary

1. This is an initial office action based of the application for a Nonaqueous Electrolyte Secondary Battery and Charge/Discharge System Thereof filed on 11/06/2006.
2. Claims 1-7 are currently pending and have been fully considered.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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6. Claims 1-2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over INOUE et al. (US 5,707,756).

As to Claim 1, INOUE et al. teaches a lithium-ion battery comprising a positive electrode having an active material layer, a negative electrode comprising a negative active material layer, a separator and a lithium-ion conductive non-aqueous electrolyte (col. 6, lines 30-61). Said positive active material comprises a lithium transition metal composite oxide (col. 11, lines 10-50) and said negative material comprises graphite (col. 15, lines 24-45) which is capable of intercalating and deintercalating lithium ions (col. 6, lines 30-61). The final charge voltage of said non-aqueous battery is set to 4.3 V (col. 44, Example 2). INOUE et al. does not expressly disclose the capacity ratio of the positive active material to negative active material as being 1.3 to 2.2. However, INOUE et al. teaches the ratio for the contents of the positive active material and negative material, depending on the varieties of the compounds and formulations of the compositions, can be optimized so as to improve the capacity, cycle life and safety of the battery (col. 33, lines 36-59). INOUE et al. is teaching that said ratio is a results effective variable. The courts have held that optimization of a results effective variable is not novel. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As to Claims 2 and 6, INOUE et al. teaches a positive active material comprising a lithium transition metal composite oxide represented by the formula: $\text{Li}_x\text{Co}_a\text{Ni}_{1-a}\text{O}_2$ wherein $x=0.2$ to 1.2 and $a=0.1$ to 0.9 . The prior art ranges taught by INOUE et al. overlap the claimed ranges. The courts have held that in the case where the claimed

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ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over INOUE et al. (US 5,707,756) as applied to claim 1 above, and further in view of LU et al. (US 2003/0027048 A1).

As to Claim 3, INOUE et al. does not expressly disclose a lithium transition metal composite oxide represented by the formula: $\text{Li}_x\text{Ni}_y\text{Mn}_z\text{M}_{1-y-z}\text{O}_2$ wherein $x= 1.0$ to 1.03 , $y= 0.3$ to 0.5 , $z=0.3$ to 0.5 and $y/z= 0.9$ to 1.1 .

However, LU et al. teaches a lithium-ion battery having a positive active material for the cathode comprising a specific composition of $\text{Li}_{1.04}\text{Ni}_{0.368}\text{Co}_{0.263}\text{Mn}_{0.38}\text{O}_2$ (pg. 5, [0054]).

These value for “x” in the prior art is very close to the claimed value of “x” and the values for “y” and “z” in the prior art fall within the claimed ranges for “y” and “z”.

According to MPEP 2144.05, “a *prima facie* case of obviousness exists where the claimed ranges and the prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).” Therefore, at the time of the invention, a person having ordinary skill in the art would have found it obvious to use the positive active material as disclosed by LU et al. in the lithium-ion battery of INOUE et al. to maximize said batteries performance, as taught by LU et al. (pg. 1-2, [0022]).

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8. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over INOUE et al. (US 5,707,756) as applied to claim 1 above, and further in view of SHOICHIRO et al. (JP 2002-319398 as found in the IDS 10/11/2005).

As to Claim 4, INOUE et al. does not expressly disclose a lithium transition metal composite oxide comprising two composite oxides represented by the two separate formulas in claim 4.

However, SHOICHIRO et al. teaches a nonaqueous electrolyte secondary battery having a positive active material mixture comprising two positive active materials (Abstract).

The first active material is $\text{Li}_x\text{Co}_y\text{M}_w\text{O}_z$ wherein $x=0.9$ to 1.1 , $y=0.85$ to 0.98 , $w=0.02$ to 0.15 and $z=1.8$ to 2.2 and M is at least one of Al, Cu, Zn, Mg, Ca, Ba and Sr (Abstract).

The second positive material is represented by the formula $\text{Li}_a\text{Ni}_b\text{M}'_c\text{O}_d$ where $a=0.3$ to 1.02 , $b=0.5$ to 0.98 , $c=0.02$ to 0.5 , $d=1.8$ to 2.2 and M' is at least one of Co, Mn, Cr, Fe, V and Al (Abstract). These ranges overlap or lie inside the claimed ranges of the present application. The courts have held that in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

Therefore, at the time of the invention, a person having ordinary skill in the art would have found it obvious to use a mixture of two positive active materials to create a composite positive active material so as to heighten a discharge capacity, create a low temperature characteristic and improve a cycle characteristic, as suggested by SHOICHIRO et al. (Abstract).

As to Claim 5, INOUE et al. teaches the ratio for the contents of the positive active material and negative material, depending on the varieties of the compounds and formulations of the compositions, can be optimized so as to improve the capacity, cycle life and safety of the battery (col. 33, lines 36-59). INOUE et al. is teaching that said ratio is a results effective variable. The courts have held that optimization of a results effective variable is not novel. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over INOUE et al. (US 5,707,756) as applied to claim 1 above, and further in view of FERNANDEZ et al. (US 5,637,413).

As to Claim 7, INOUE et al. does not expressly disclose a charge/discharge system comprising a battery as recited in claim 1 and a charger, wherein said charger is set to stop charging when the voltage of said battery reaches 4.25 to 4.5 volts.

However, FERNANDEZ et al. teaches a charger for lithium ion cells wherein an overvoltage based disconnect circuit is used so as to disconnect the battery from the charger if the voltage of the cell reaches a threshold level (col. 1, lines 56-65).

At the time of the invention, a person having ordinary skill in the art would have found it obvious to employ a charger for charging the battery of INOUE et al. with a disconnect circuit so as to stop charging the battery of INOUE et al. when said battery reaches its

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final charge voltage of said non-aqueous battery is set to 4.3 V (col. 44, Example 2), so as to protect the battery from overcharging, as suggested by FERNANDEZ et al.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADAM A. ARCIERO whose telephone number is (571)270-5116. The examiner can normally be reached on Monday to Friday 8am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AA

/SUSY N TSANG-FOSTER/
Supervisory Patent Examiner, Art Unit 1795